

# Notice of Allowability

Application No.

10/791,627

Examiner

Ling-Siu Choi

Applicant(s)

KURAMOTO ET AL.

Art Unit

1713

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07/10/2006.
2. ☒ The allowed claim(s) is/are 1-15.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☒ Certified copies of the priority documents have been received in Application No. 10/346,340.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 7/10/06, 5/23/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other Supplemental Office Action.

*Supplemental*  
**Office Action Summary**

Application No.

10/791,627

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Examiner

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**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

1. This Office Action is in response to a Response filed July 10, 2006. Claims 16-27 were canceled and Claims 1-15 are now pending.

***Allowable Subject Matter***

2. Claims 1-15 are allowed.

3. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Arakawa et al. (US 6,395,341 B1).

Summary of claim 1:

A multi-layer laminate comprising a plurality of successively stacked layers of respective organic-inorganic composite materials, wherein		
• each of the organic-inorganic composite materials is respectively produced		
1	hydrolyzing and polycondensing	the metal alkoxide of a metal element
	until the unreacted metal alkoxide is reduced to 3 vol % or less	
2	<u>mixing</u>	<u>the resulting polycondensated metal alkoxide</u>
		<u>an organic polymer</u>
• the layers respectively have different concentrations of a metal element in the respective organic-inorganic composite material such that the laminate has a concentration gradient with a varying concentration of the metal element through a thickness of the laminate from a first side to a second side of the laminate		

Arakawa et al. disclose a multiple layer comprising organic-inorganic hybrid polymer materials with compositional gradient, the organic-inorganic hybrid polymer being obtained hydrolyzing and polycondensation metal alkoxide in the presence of an organic polymer (col. 7, lines 37-51; col. 8, lines 6-22; claim 1). In other words, the unreacted metal alkoxide remains 100 vol % in mixing with the organic polymer. In view of Table 3 and Figure 13 of the present Application, the mixing of 100 vol % and the organic polymer leads to the organic-inorganic hybrid polymer having a low film transmittance and a larger domain size. However, Arakawa et al. do not teach or fairly suggest a multiple-layer laminate comprising each layer having different concentration of silicon and being obtained by polycondensation of the metal alkoxide through hydrolysis until the unreacted metal alkoxide is reduced to no more than 3 vol.%, and then contacting with an organic polymer.

Toki et al. disclose an organic-inorganic composite material obtained by the steps comprising stirring poly(vinylpyrrolidone), tetraethoxysilane, and HCl to form a mixture and then air-drying the mixture to form a transparent hybrid material (page 654 - Experimental). Since no step is required to remove tetraethoxysilane, it is believed that the entire amount of tetraethoxysilane is subjected to a condensation polymerization. However, Toki et al. do not teach or fairly suggest a multiple-layer laminate comprising each layer having different concentration of silicon and being obtained by polycondensation of the metal alkoxide through hydrolysis until the unreacted metal alkoxide is reduced to no more than 3 vol.%, and then contacting with an organic polymer.

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Yang et al. disclose an organic-inorganic composite material obtained by the steps comprising hydrolyzing and condensing tetraethyl orthosilicate in the presence of poly(methylmethacrylate-co-3-(trimethoxysilyl) propyl methacrylate) and an aqueous HCl catalyst (pages 49-50). However, Yang et al. do not teach or fairly suggest a multiple-layer laminate comprising each layer having different concentration of silicon and being obtained by polycondensation of the metal alkoxide through hydrolysis until the unreacted metal alkoxide is reduced to no more than 3 vol.%. and then contacting with an organic polymer.

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

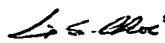
### ***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

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**LING-SUI CHOI**  
**PRIMARY EXAMINER**

September 12, 2006